MOUNT FOR AN INPUT DEVICE

BACKGROUND

[0001] The invention relates to a mount, and more particularly to a mount for an input device, such as a computer keyboard.

[0002] Computers and their components, such as computer keyboards, are often used with medical devices such as rehabilitation and physical therapy devices. Known mounts have been provided for coupling keyboards to such medical devices.

[0003] At times, however, persons who are in a supine position need to interact with a computer that is being used in conjunction with such a medical device. These known mounts are not configured to retain keyboards in many different orientations. For example, known mounts do not retain keyboards when the keyboards are placed in vertical orientations. Therefore, it is difficult for a person who is in a supine position to control the computer. Additionally, known mounts are not configured to retain keyboards such that the keyboards are prevented from separating from the mount when the keyboard or the mount is accidentally bumped by a user.

[0004] Thus, a need exists for a keyboard mount that is configured to retain a keyboard in many different positions, including a vertical position. Additionally, a need exists for a keyboard mount that retains the keyboard such that the keyboard is prevented separating from the mount when the keyboard or the mount is accidentally bumped by a user.

SUMMARY OF THE INVENTION

[0005] A mount is coupled to a support member and is configured to removably retain an input device, such as a computer keyboard. The mount is configured to retain the input device in several different orientations, including a substantially vertical orientation. Additionally, the mount is configured to retain the input device such that the input device does not separate from the mount when the mount or the input device is accidentally bumped by a user. In one embodiment, the mount may be used in conjunction with an arm to retain a keyboard in several different positions, including a standing position, a sitting position, and a supine position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Figure 1 is a schematic illustration of a mount system according to an embodiment of the invention retaining an input device in a substantially horizontal orientation.

[0007] Figure 2 is a schematic illustration of the mount system illustrated in Figure 1 retaining an input device in a substantially vertical orientation.

[0008] Figure 3 is a perspective view of a mount system according to an embodiment of the invention.

[0009] Figure 4 is a perspective view of the mount system of Figure 3 retaining an input device.

[00010] Figure 5 is an exploded view of the mount system of Figure 3.

[00011] Figure 6 is a mount assembly according to an embodiment of the invention in a first position.

[00012] Figure 7 is the mount assembly of Figure 6 in a second position.

[00013] Figure 8 is the mount assembly of Figure 6 in a third position.

[00014] Figure 9 is a perspective view of a mount system according to another embodiment of the invention.

[00015] Figure 10 is a top view of the mount system of Figure 9.

[00016] Figure 11 is a bottom view of the mount system of Figure 9.

[00017] Figure 12 is a front view of the mount system of Figure 9.

[00018] Figure 13 is a rear view of the mount system of Figure 9.

[00019] Figures 14 and 15 are side views of the mount system of Figure 9.

DETAILED DESCRIPTION

[00020] In some embodiments, a mount is configured to removably retain or grip an input device without modification to the input device. In other words, an input device, without modification to the input device, may be removably retained or gripped by the mount. The terms "retain" and "grip" as used herein mean that a force is produced on the input device to couple the input device to the mount. The term "modification" as used herein means a post-manufacture change. Thus, an input device that has not been modified is an input device in substantially the

same state as it was when it was manufactured. For example, an extra coupling structure, such as hook-and-loop material, a mount-mating opening, or other coupling member, has not been added to the input device since the manufacture of the input device. Thus, the mount can removably retain or grip a generic input device as it was manufactured and any customization for use in a mount is unnecessary.

[00021] In some embodiments, the mount is configured to place the input device in several different orientations, including a substantially vertical orientation. The term "substantially vertical" as used herein means the orientations ranging from a vertical orientation with respect to a ground or a floor to 30° in either direction from such vertical orientation. Because the mount retains or grips the input device, gravity does not cause the input device to separate from the mount when the input device is placed in a substantially vertical orientation. Additionally, the input device does not separate from the mount when the mount and/or the input device are accidentally bumped by a user.

[00022] In one embodiment, the mount is configured to be used in conjunction with an placement device, such as an extension arm. In such an embodiment, the mount/placement device combination is configured to retain an input device in a standing position, a sitting position, and a supine position. Thus, a user in a standing position, a user in a sitting position, and a user in a supine position may use the input device without the input device becoming separated from the mount.

[00023] Figures 1 and 2 are schematic illustrations of a mount system 20 according to an embodiment of the invention. The mount system 20 includes a support member 30 that is pivotally coupled to a mount 40. The mount 40 is configured to removably retain or grip an

input device K in several different orientations. The term "input device" is used herein to mean any type of input device, including, but not limited to, a computer keyboard, a numeric keypad, and a touch pad.

[00024] As illustrated in Figure 1, the mount 40 is configured to retain the input device K in a substantially horizontal orientation. In other words, an input side KS of the input device K, or the face of the input device that includes input components such as keys or buttons, extends in a substantially horizontal plane. The term "substantially horizontal" as used herein means the orientations ranging from a horizontal orientation with respect to a ground or a floor to 30° in either direction from such horizontal orientation. Additionally, the term "horizontal" is sometimes used herein as a convenient abbreviation for the term "substantially horizontal."

[00025] As illustrated in Figure 2, the mount 40 is configured to retain the input device K in a substantially vertical orientation. In other words, the input side KS of the input device K extends in a substantially vertical plane. As defined above, the term "substantially vertical" as used herein means the orientations ranging from a vertical orientation with respect to a ground or a floor to 30° in either direction from such vertical orientation. Additionally, the term "vertical" is sometimes used herein as a convenient abbreviation for the term "substantially vertical."

[00026] Figures 3 through 5 illustrate an embodiment of a mount system 120 according to an embodiment of the invention. The mount system 120 includes a support member 130, a first mount 140, and a second mount 190.

[00027] In one embodiment the support member 130 is an elongated member. The support member 130 has a first end portion 132 and a second end portion 134. The second end portion 134 of the support member 130 is coupled to a first end portion 142 of the first mount 140 such

that the first mount 140 can slide with respect to the support member 130 in four different directions. Specifically, the first mount 140 can slide along the support member 130 in a first direction towards the first end portion 132 of the support member 130 and in a second direction towards the second end portion 134 of the support member 130. Additionally, the first mount 140 can slide with respect to the support member 130 in a third direction towards the support member 130 and in a fourth direction away from the support member 130. In other words, the first mount 140 can slide with respect to the support member 130 such that a center portion 141 of the first mount 140 moves in a direction toward the support member 130 and in a direction away from the support member 130. The first mount 140 is also coupled to the support member 130 such that the first mount 140 can pivot with respect to the support member 130.

[00028] In one embodiment, the first mount 140 includes a slot 146 disposed at the first end 142 of the first mount 140. The support member 130 is slidably received within the slot 146 of the first mount 140. In this embodiment, the support member 130 slides and pivots with respect to the first mount 140 within the slot 146 of the first mount 140.

[00029] In alternative embodiments, the first mount is slidably or pivotally coupled to the support member. In a further alternative embodiment, the first mount is fixedly coupled to the support member. Said another way, in this further embodiment, the first mount is neither slidably nor pivotally coupled to the support member.

[00030] In one embodiment, the mount system 120 includes a collar 148. The collar 148 is disposed within the slot 146 of the first mount 140. The collar 148 is pivotally and slidably coupled to the first mount 140, and is slidably coupled to the support member 130. In one embodiment, the collar 148 defines an opening (not illustrated) through which support member

130 is slidably received. In other words, the support member 130 extends though the opening of the collar 148 and slides within the opening with respect to the collar 148.

[00031] The mount system 120 includes a lock 150 that is configured to lock the first mount 140 with respect to the support member 130. In one embodiment, the lock 150 includes a first lock knob 152 disposed on a first side 122 of the mount system 120 and a second lock knob 154 disposed on a second and opposite side 124 of the mount system 120. A pin 156 extends through elongated openings 126 and 128 disposed on a first side 158 of the first mount 140 and a second side 160 of the first mount 140, respectively. The pin 156 also extends through the collar 148 of the mount system 120.

[00032] The first lock knob 152 is coupled to a first end portion 158 of the pin 156. Similarly, the second lock knob 154 is coupled to a second end portion (not illustrated) of the pin 156. The lock knobs 152 and 154 are coupled to the pin 156 such that rotation of the lock knobs 152 and 154 in a first direction loosens the connection between the first mount 140 and the support member 130. Additionally, rotation of the lock knobs 152 and 154 in a second direction opposite of the first direction of rotation tightens the connection between the first mount 140 and the support member 130.

[00033] Thus, the lock knobs 152 and 154 may be rotated to loosen the first mount 140 with respect to the support member 130. When the first mount 140 is loose with respect to the support member 130, a user may slide the first mount 140 with respect to the support member 130 and/or pivot the first mount 140 with respect to the support member 130 to place the first mount 140 in a desired position with respect to the support member 130. A user may then rotate the lock knobs 152 and 154 to fix the first mount 140 with respect to the support member 130 at

the desired position. In one embodiment, the lock knobs 152 and 154 may be rotated individually, one knob at a time. In an alternative embodiment, only one of the lock knobs needs to be rotated to fix the first mount with respect to the support member.

[00034] In an alternative embodiment, the connection mechanism does not include a pair of lock knobs, rather the connection mechanism is a device such as a lock pin or screw that is configured to lock the first mount into a fixed position with respect to the support member.

[00035] The mount system 120 includes an end pin 121 that is configured to prevent the first mount 140 from uncoupling or separating from the support member 130. In one embodiment, the end pin 121 is disposed proximate the second end portion 134 of the support member 130 and extends from a first side 131 of the support member 130 to a second side 133 of the support member 130. In this embodiment, the end pin 121 protrudes from the first side 131 of the support member 130 and the second side 133 of the support member 130 such that the end pin 121 is configured to contact the first mount 140 to prevent the first mount 140 from becoming uncoupled or separating from the support member 130.

[00036] The first mount 140 is configured to removably retain or grip an input device D without modification to the input device D. In other words, an input device, without modification to the input device, may be removably retained or gripped by the first mount 140. It should be understood that because the first mount 140 retains or grips the input device D, gravity does not cause the input device D to separate from the first mount 140 when the input device D is placed in a vertical orientation. Additionally, the input device D does not separate from the first mount 140 when the first mount 140 and/or the input device D are accidentally bumped by a user.

[00037] The first mount 140 includes a first elongate member 162 and a second elongate member 164. In one embodiment, the first elongate member 162 includes a first end 166 disposed proximate the support member 130 and a second end 168.

[00038] The first elongate member 162 includes a plate 170 fixedly coupled to a top side 172 of the first elongate member 162, for example, via a pair of screws or rivets. The plate 170 has a first retention member 174 that extends from a top side 172 of the plate 170. In one embodiment, the first retention member 174 includes a first protrusion portion 176 and a second protrusion portion 178. The first protrusion portion 176 and the second protrusion portion 178 of the first retention member 174 are configured to contact a side of an input device D. In one embodiment, covers 163 and 165, such as rubber covers, are coupled to the first protrusion portion 176 and the second protrusion portion 178, respectively.

[00039] In one embodiment, the first retention member is monolithically formed with the plate. In an alternative embodiment, the first retention member is fixedly coupled to the plate via screws, rivets, or any other conventional coupling mechanism. In a further alternative embodiment, the first retention member is coupled directly to the first elongate member of the first mount. In such an embodiment, the plate is not present.

[00040] Although the first retention member is illustrated as having two protrusion portions, it is not necessary that the first retention member have two protrusion portions. In alternative embodiments, the first retention member has one, three, or any other number of protrusion portions.

[00041] The mount system includes an "L" shaped bracket 180. The "L" shaped bracket 180 is fixedly coupled to a bottom side (not illustrated) of the first elongate member 162. In one

embodiment, a first portion 181 the "L" shaped bracket 180 may be coupled to the first elongate member 162 at any one of several different locations. As will be discussed in more detail below, the different locations allow the second elongate member 164 of the first mount 140 to be coupled to the first elongate member 162 at different locations to therefore allow input devices of different sizes to be coupled to the first mount.

[00042] In one embodiment, the "L" shaped bracket 180 is coupled to the first elongate member via screws or rivets. In an alternative embodiment, the "L" shaped bracket is coupled to the first elongate member via another coupling mechanisms, such as a brad, an adhesive, such as glue, or any other conventional coupling mechanism 140.

[00043] Turning to the second elongate member 164 of the first mount 140, the second elongate member 164 of the first mount 140 includes a first end portion 182 and a second end portion 184. A second retention member 186 is coupled to the second elongate member 164 proximate the second end portion 184 of the second elongate member 164. The second retention member 186 includes a protrusion portion 188 that is configured to extend above a top side 189 of the second elongate member 164. The protrusion portion 188 of the second retention member 164 is configured to contact a side of an input device D.

[00044] In one embodiment, the second retention member 188 is coupled to the second elongate member 164 via a screw or a rivet. In an alternative embodiment, the second retention member is coupled to the second elongate member via a brad, an adhesive, or any other conventional coupling mechanism. In a further alternative embodiment, the retention member is monolithically formed with the second elongate member.

[00045] The first mount 140 includes a handle 187 that is configured to be grasped by a user of the mount system 120. The handle 187 is coupled to the second elongate member 164 proximate the second end portion 184 of the second elongate member 164. In one embodiment, the handle 187 is coupled to the second elongate member 164 via a screw or a rivet. In an alternative embodiment, the handle is coupled to the second elongate member via another conventional coupling mechanism.

[00046] The second elongate member 164 of the first mount 140 is slidably coupled to the first elongate member 162 of the first mount 140. In one embodiment, the first end portion 182 of the second elongate member 164 is telescopically coupled to the second end portion 168 of the first elongate member 162. In other words, the first elongate member 162 includes an opening or a cavity 185 that slidably receives at least a portion of the second elongate member 164. In an alternative embodiment, the second elongate member is slidably coupled to a top, a bottom or a side of the first elongate member.

[00047] In one embodiment, the first end portion 182 of the second elongate member 164 extends through the opening 185 disposed at the second end 168 of the first elongate member 162 and is coupled to a second portion 183 of the "L" shaped bracket 180. The second elongate member 164 is coupled to the second portion 183 of the "L" shaped bracket 180 via a screw 179. A tubular spring 177 is disposed around a shaft 173 of the screw between the second portion 183 of the "L" shaped bracket 180 and a head 175 of the screw. Thus, the second elongate member 164 is movably coupled to the "L" shaped bracket 180.

[00048] The spring 177 is configured to bias the second elongate member 164 towards and into an abutting relationship with the second portion 183 of the "L" shaped bracket 180. A force,

such as a force in the direction of the arrow A illustrated in Figure 3, however, may be applied by a user to the second elongate member 164 to move (against the bias of the spring 177) the second elongate member 164 a distance away from the "L" shaped bracket 180 and the first elongate member 162. When the force is removed from the second elongate member 164 the spring 177 again biases the second elongate member 164 into an abutting relationship with the second portion 183 of the "L" shaped bracket 180.

[00049] In an alternative embodiment, the second elongate member is not spring biased into an abutting relationship with the "L" shaped bracket, rather another type of biasing force is used to bias the second elongate towards the first elongate member, such as a gravity force, a magnetic force, or any other force conventionally used to provide a bias. In a further alternative embodiment, the second elongate member is not biased towards the first elongate member, rather a lock system, such as a detent system or a lock pin, secures the second elongate member in a fixed position with respect to the first elongate member.

[00050] In use, a user of the mount system 120 may removably couple an input device to the first mount 140. To mount an input device to the first mount 140, a user may apply a force to the second elongate member 164, such as by grasping the handle 187 of the first mount 164 and pulling the second elongate member 164 away from the first elongate member 162 (in the direction of the arrow A illustrated in Figure 3). Assuming that the force applied by the user is greater than the force of the spring 177 that biases the second elongate member 164 towards the first elongate member 162, the second elongate member 164 will move away from the first elongate member 162. Thus, the second retention member 186 will move from a first position to a second position. It should be understood that the distance between the first retention member 174 and the second retention member 186 when the second retention member 186 is at its second

position is greater than the distance between the first retention member 174 and the second retention member 186 when the second retention member 186 is at its first position.

[00051] A user may then place an input device on the first mount 140 between the second retention member 186 and the first retention member 174. Once the input device is placed on the first mount 140, the user may remove the force applied to the second elongate member 164 The spring biasing force will move the second elongate member 164, including the second retention member 168, towards the first elongate member 162 and the first retention member 174. In other words, the second retention member 168 will be placed into a third position between the first position and the second position relating to an edge of the input device. It should be understood that the distance between the first retention member 174 and the second retention member 186 when the second retention member 186 is at its second position is greater than the distance between the first retention member 174 and the second retention member 186 when the second retention member 186 is at its third position. In one embodiment, the distance between the first retention member and the second retention member when the second retention member is at its first position is the same as the distance between the first retention member and the second retention member when the second retention member is at its third position. In this embodiment, the third position corresponds to the first position.

[00052] The spring biasing will cause a force to be applied to two sides of the input device D. Specifically, the first retention member 174 applies a force in a first direction to a first side (not illustrated) of the input device D. Similarly, the second retention member 186 applies a force in a second direction to a second side DS of the input device D. In one embodiment, the first side of the input device is opposite to the second side of the input device.

[00053] As briefly discussed above, the "L" shaped bracket 180 may be coupled to the first elongate member 162 of the first mount 140 at several different locations. Depending on where the "L" shaped bracket 180 is coupled to the first elongate member 162, the second end portion 184 of the second elongate member 164 will be disposed closer to or further from the first elongate member 162. Thus, it should be understood that a user may couple the "L" shaped bracket 180 to different locations on the first elongate member 162 to allow input devices of different sizes to be coupled to the first mount 140. For example, a user may couple the "L" shaped bracket 180 at a first location on the first elongate member 162 to allow an input device that is eight inches wide to be coupled to the first mount 140. Similarly, the user may couple the "L" shaped bracket 180 at a second location on the first elongate member 162 to allow an input device that is six inches wide to be coupled to the first mount 140.

[00054] Turning to the second mount 190 of the mount system 120. The second mount 190 of the mount system is configured to couple an output device (not illustrated) to the support member 130. The term "output device" is used herein to mean any type of output device, including, but not limited to, a computer monitor, a sound speaker, and a television monitor. The second mount 190 is fixedly coupled to the support member 130 via screws or rivets. In an alternative embodiment, the second mount is fixedly coupled to the support member via another coupling means, such as an adhesive or brads.

[00055] In one embodiment, the second mount 190 includes several screws 192 that extend through the second mount 190. The screws 192 are configured to extend into and couple an output device to the second mount 190. In an alternative embodiment, the second mount includes brads, an adhesive, or another conventional coupling mechanism to couple an output device to the second mount.

[00056] As illustrated in Figures 6 through 8, a mount system 220 including a support member 230 and a mount 240 that is configured to retain or grip an input device M may be used in conjunction with an arm 270 (the mount system 220 and the arm 270 are collectively referred to as the "mount assembly 280"). The mount assembly 280 may be placed in several different configurations.

[00057] The arm 270 includes a first portion 272 that is pivotally coupled to a second portion 274 of the arm 270. The first portion 272 of the arm 270 is pivotally coupled to a base 250. Similarly, the second portion 274 of the arm 270 is pivotally coupled to the mount system 220, such as to the support member 230. In one embodiment, all of the couplings between the base 250, arm 270, and mount system 220 are movable couplings such as pivotal couplings or slidable couplings. In another embodiment, less than all of the couplings between the base, arm, and mount system are movable couplings. In other words, in an alternative embodiment not all of the couplings between the base, arm, and mount system allow for movement of one item with respect to another item coupled thereto.

[00058] Known coupling devices may be used to couple the base 250, arm 270, and mount system 220. For example, a pivotal hinge (not illustrated) may be coupled between the base 250 and the arm 270 to allow the arm 270 to pivot with respect to the base 250.

[00059] The base 250 supports the mount assembly 280. In one embodiment, the base is a wall of a room. In an alternative embodiment, the base is a ceiling of a room, a floor of a room, a medical device, such as a muscular rehabilitation device, or any other object that provides support to the mount assembly.

[00060] Figure 6 illustrates the mount assembly 280 in a first configuration. In the first configuration, the mount assembly 280 disposes and retains an input device M at a first position and in a horizontal orientation. At the first position, the input device M and the mount 240 are disposed at a height such that a user U in a standing position may use the input device M. The horizontal orientation of the input device M facilitates a standing user to use the input device M.

[00061] Figure 7 illustrates the mount assembly 280 in a second configuration. In the second configuration, the mount assembly 280 disposes and retains the input device M at a second position and in a horizontal orientation. At the second position, the input device M and the mount 240 are disposed at a height such that a user U in a seated position may use the input device M. The horizontal orientation of the input device M facilitates the use of the input device M by a user U in a seated position.

[00062] Figure 8 illustrates the mount assembly 280 in a third configuration. In the third configuration, the mount assembly 280 disposes and retains the input device M at a third position and in a vertical orientation. At the third position, the input device M and the mount 240 are disposed at a height such that a user in a supine position may use the input device M. The vertical orientation of the input device M facilitates the use of the input device by the user U in a supine position.

[00063] Figures 9 through 15 illustrate another embodiment of a mount system 320 according to the invention. The mount system 320 includes a support member 330 and a mount 340 configured to retain or grip an input device, such as a keyboard.

[00064] While the invention has been described in detail and with references to specific embodiments thereof, it will be apparent to one skilled in the art that various changes and

modifications can be made therein without departing from the spirit and scope thereof. For example, although the mount is generally illustrated and described as applying force to a front side and a rear sides of the input device, the mount can instead be configured to contact and apply force to any two sides of an input device, including, for example, a top side and a bottom side, or a left side and a right side. In further embodiments, the mount is configured to contact and apply a force to a different number of sides of the input device.

[00065] In one embodiment, the mount is configured to contact and apply force to only one side of an input device. In such an embodiment, another portion of the mount system, such as the support member, is configured to contact and apply force to at least one side of the input device. In this embodiment, the contact portions of the mount system are defined as portions of the mount.